

LARIMER COUNTY | ENGINEERING DEPARTMENT

P.O. Box 1190, Fort Collins, Colorado 80522-1190, 970.498.5700, Larimer.gov

The role of the Advisory Board is to advise the Board of County Commissioners and appropriate departments on environmental and science-related issues that affect Larimer County.

Environmental and Science Advisory Board.

MINUTES-DRAFT

Date: March 11th, 2025.

Time: 6:00 – 9:00 p.m.

Location: Rm 150 Carter Lake, 200 West Oak St., Fort Collins, Colorado and Virtual by Zoom.

Contact: Shelley Bayard de Volo, sbayard@larimer.org or 970.498.5738.

MEMBERS	-	STAFF	-	GUESTS
Rodger Ames – Vice-Chair	X	John Kefalas *	-	CDPHE/FC AQAB/AQMAC
Tasha Carr	X	Shelley Bayard de Volo ‡	X	Dan Welsh
Anna Cloud - Chair	X	Heidi Pruess§	X	-
Jim Gerek	X	Lea Schneider	X	Colorado State University
Leo Grassens	X	-	X	Jeff Collett
Matthew Haag	X	-	-	Andrey Marsavin
Michael Lee Jones	X	-	-	-
Zachary Maffeo	X	-	-	Denver Metro/NFR-RAQC
Jared McGlothlin	X	-	-	Tom Moore
Barry Noon	X	-	-	-
Nicole Poncelet-Johnson	X	-	-	Larimer Alliance
Timothy Skolds	X	-	-	Ed Behan
Natalie Walsh	X	-	-	Attendee
Chris Wood	X	-	-	Ashton Brodahl

X = present; * = Commissioner Liaison; ‡ = Engineering; † = ESAB Liaison; § = Climate and Sustainability Program; α = Larimer County Health and Environment; £ = Engineering.

Call to Order: 6:00 p.m.

1. **Amendments or additions to the agenda** – For the roundtable Jim and Anna both have updates.





2. **Introduction of members, staff and guests** – Guests and ESAB members introduced themselves.
3. **Commissioner's Update** – The commissioner explained that the decision was made by the BOCC to remove public comment periods from all boards that are not required to have a public comment period per state statute. The ESAB will no longer accept public comments. There was an application hearing last night from the Platte River Power Authority on their 1041 permit application. The meeting was well attended. The State legislature is halfway through the session and has introduced over 500 bills. The budget bill involves filling a 1.4-billion-dollar deficit. March 17th, the BOCC will receive from the State a quarterly update on the economic forecast. At the Federal level, the BOCC is trying to keep track of funding and whether certain grants have been frozen and can be released. Some commissioners, along with the Colorado delegation attended the NAco legislative conference last week. The BOCC had a good work session with Matt Sura on the State's oil and gas rulemaking. They are developing tools on advanced leak technology, and once this is finished the County will have to update its oil and gas regulations.

Discussion Items

- Front Range Ozone Study Plans – Jeff Collett, CSU Atmospheric Sciences, presented slides describing the Ozone monitoring study that his group is leading. They collected data in 2024 and will continue with data collection and analysis through 2027. The study will focus on Ozone and VOCs (volatile organic compounds) emitted from various sources. Their analysis will include attributing VOCs to various sources like oil/gas production, transportation and biogenic sources. The slides from their presentation are attached to these minutes.
 - Larimer County Health and Environment Air Quality Program Updates – Lea Schneider presented on the Health Department's Air Quality Program. She played a video created by her program titled Air Quality and Ground-Level Ozone in Larimer County. The [video](#) is hosted on YouTube. She went over the monitoring stations located within Larimer County, showing a [map](#) of their locations. For more information read this [spot-light](#) on the station in Timnath. She also noted the collaboration of her team with the City of Fort Collins and CSU on an EPA grant. As part of that grant the team engaged with the community and hosted an event that included an art exhibit focusing on particulate pollution. For more information visit the Larimer County Air Quality [website](#).
 - Environmental Stewardship Awards, Designate Review Committee - Anna asked if members were interested in serving on the review sub-committee. Natalie, Anna, Nicole, Leo and Rodger all expressed interest and will review the applications.
4. **Approval of Minutes** – Shelley showed the February minutes on the screen. It was the redlined version that included edits by Jim. Jim motioned to approve the February minutes, as amended by Shelley, and Michael seconded. All were in favor and the February minutes were approved.
 5. **Updates and Round Table**
 - Workplan as updated by Heidi – Heidi explained that once the ESAB approved their draft workplan, she was asked by the County Manager to look at it and add topics that



she thought were priorities and that aligned with the Strategic Plan and the CSFR initiative. Heidi went through the added topics and explained how they aligned.

- ESAB Liaison Transition update – Shelley explained that the BOCC requested that the staff liaison transition from the Engineering Dept. to the Commissioner’s Office. The benefit is that the Liaison will be closer to the County Manager than staff within the Engineering Department. Heidi will take over the Staff Liaison position starting in June.
 - Changing ESAB meeting Day – Anna noted that the best day to change the meeting day to would be Thursday evening. Changing the time of day from evening won’t work for some members. Other days of the week won’t work for the Commissioner. The matter is tabled for a future time.
 - Bylaws update – the Bylaws were reviewed, and Heidi was asked to edit them to remove all references that were also in the 100.1J policy. She has completed that and is waiting for approval from the commissioners. She will provide an update at the April meeting.
 - ESAB Membership Application – Shelley reminded members that if they want to serve another term, to make sure they get their applications completed online.
2. **Agenda Topics for Future Meetings** –In April an update on the Environmental Stewardship Awards. There might be an update on the Larimer on the Move.
6. **Adjourn** – The meeting adjourned at 9:00 PM.

Front Range Ozone Study Plans

Prof. Jeffrey L. Collett Jr. (collett@colostate.edu)

Prof. Emily V. Fischer

Andrey Marsavin, PhD student

Atmospheric Science Department

Colorado State University

Tom Moore, Regional Air Quality Council

Erick Mattson, CDPHE APCD

Larimer County ESAB Presentation

March 11, 2025



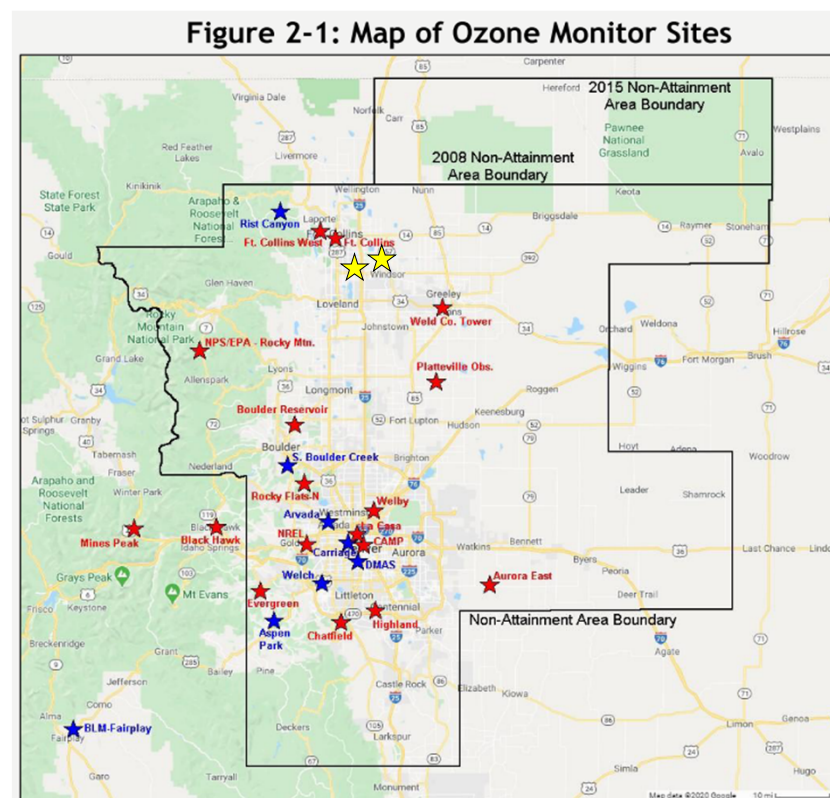
**COLORADO STATE
UNIVERSITY**

Ground level ozone is a major concern in the Denver Metro North Front Range area, including Larimer County

VOC and NO_x sources vary across non-attainment area

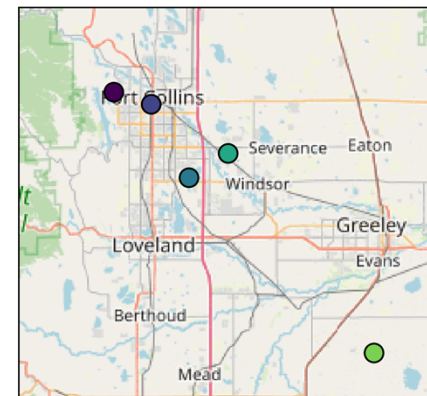
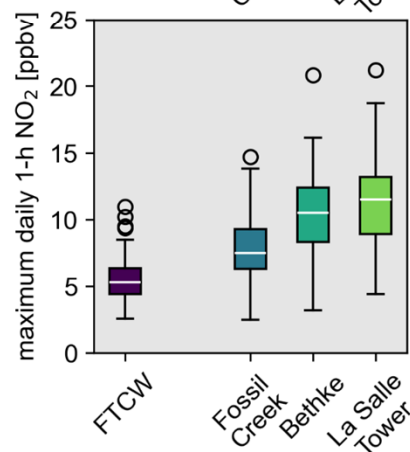
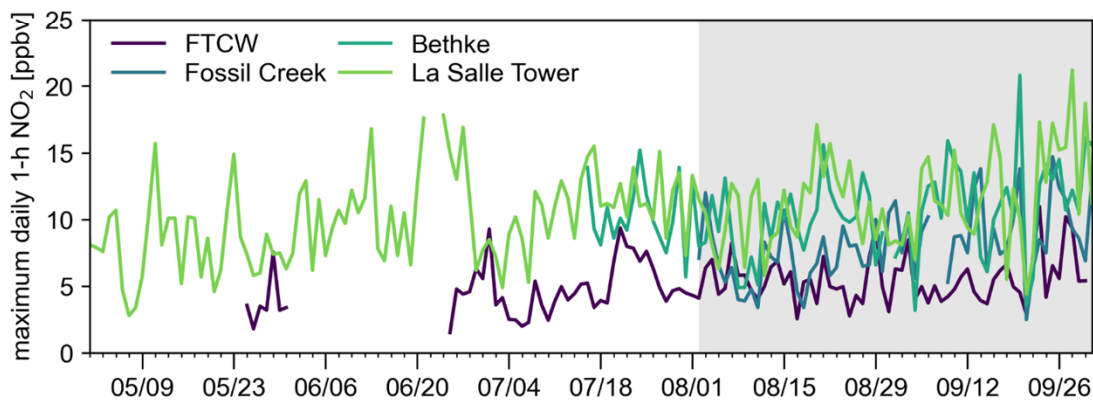
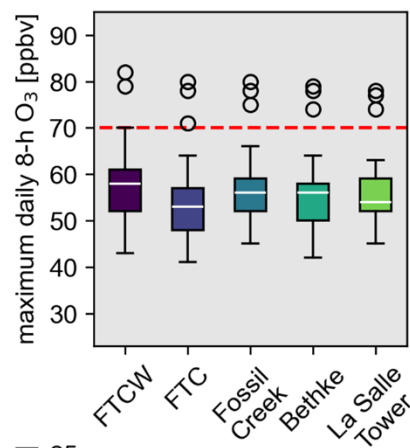
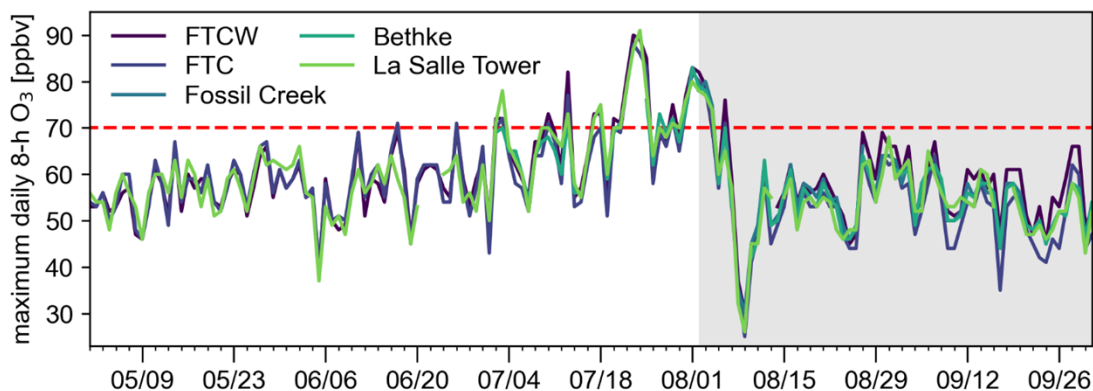
Are conditions in Larimer County similar to those at other problematic sites in Denver Metro area?

Little history of VOC and NO_x monitoring, especially in Larimer County



Source: RAQC. Red stars are sites active in 2023; Blue stars are sites since 2006 no longer operating. Yellow stars are new LarCo sites.

Larimer/Weld County O₃ and NO_x measurements: summer 2024



gray shading indicates the timeframe when data from all sites is available; box plots are based on this data

Sites exceeding O₃ NAAQS

Fort Collins West among 4 highest ozone sites in the non-attainment area

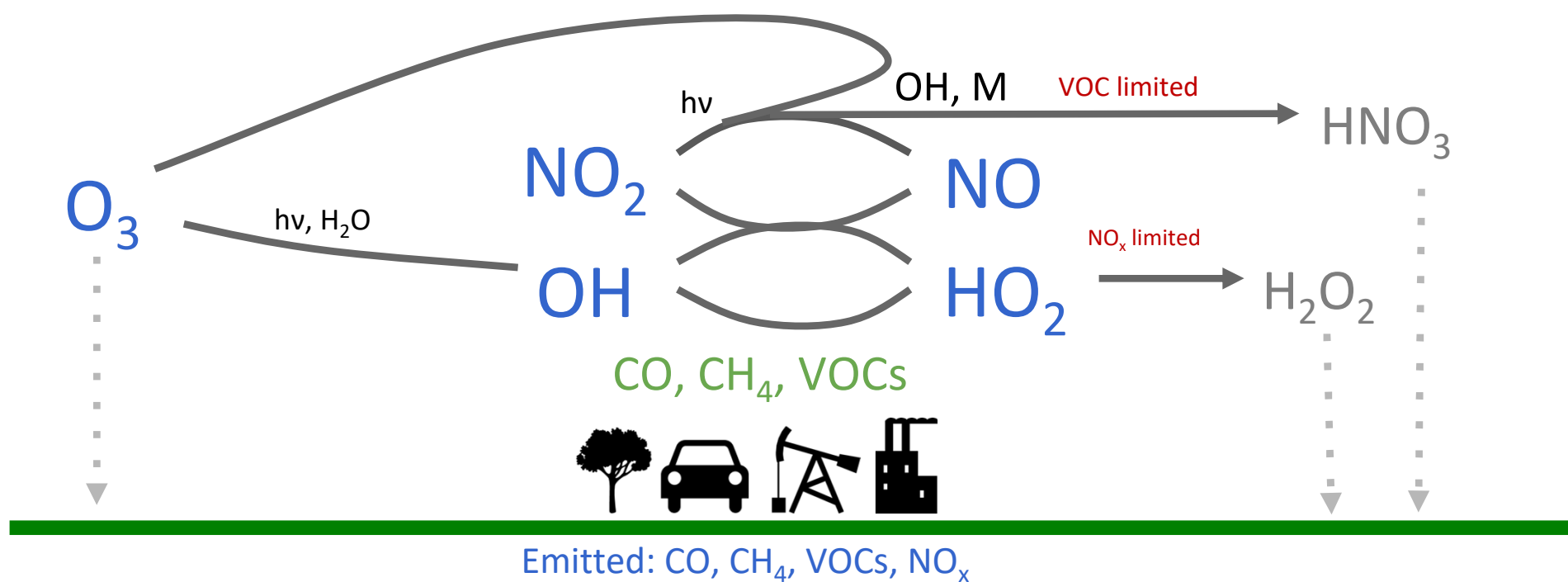
Attainment of the 75 and especially 70 ppbv standards remains a major challenge

Ozone design values* from 2023 Severe Plan for 75 ppb 2008 NAAQS

Site	County	Base Year Monitored Design Values	Modeled RRFs	2026 Projected Monitored Design Values
NREL	Jefferson	79.3	0.9415	74.6
CHAT	Douglas	77.3	0.9256	71.5
FTCW	Larimer	75.7	0.9451	71.5
RFNO	Jefferson	77.3	0.9206	71.1
HIGH	Arapahoe	73.0	0.9268	67.6
WELC	Jefferson	73.0	0.9249	67.5
WELD	Weld	70.0	0.9534	66.7
FTCO	Larimer	69.0	0.9506	65.5
CASA	Denver	68.7	0.9516	65.3
RMNP	Larimer	69.3	0.9404	65.1
CAMP	Denver	67.7	0.9528	64.5
ASNP	Jefferson	70.0	0.9207	64.4
AURE	Arapahoe	67.7	0.9476	64.1
WELB	Adams	67.0	0.9457	63.3

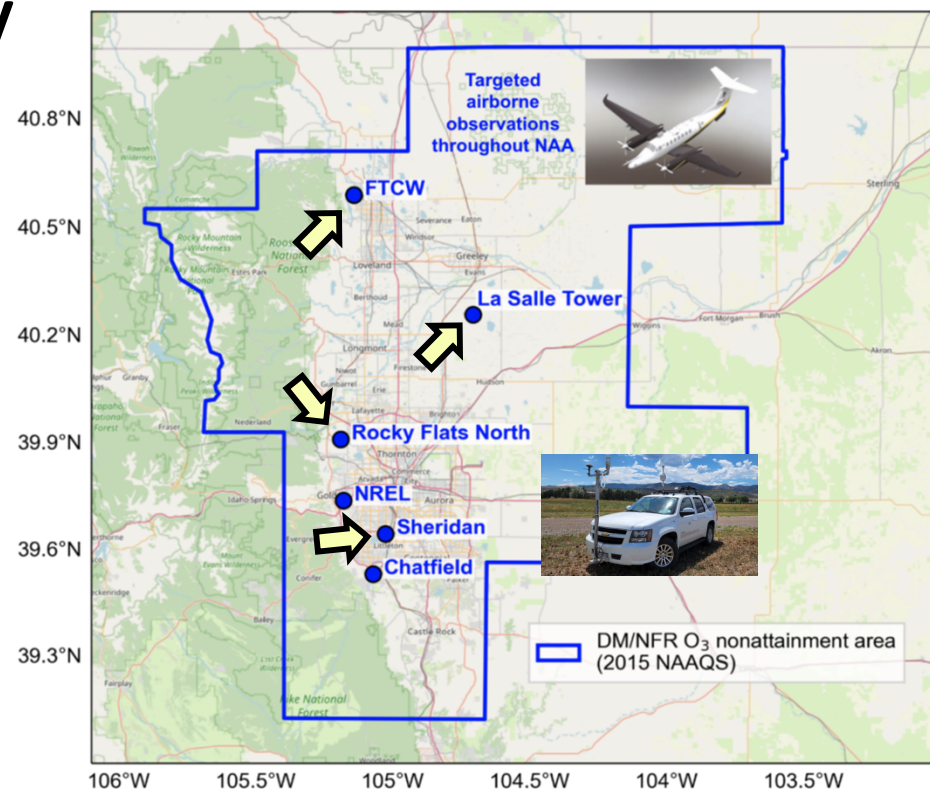
* Ozone design values exceeding the 75 ppb 2008 NAAQS and the 2015 70 ppb ozone NAAQS are colored pink and yellow, respectively.

To understand O_3 , we need to observe its precursors.



Front Range Ozone Study

- RAQC – CSU - APCD
- June-August 2025 field study
- Funded by Colorado Air Quality Enterprise
- Field measurements
 - Core ground monitoring sites (O_3 , VOCs, NO_x/NO_y) from FTCW to south Denver
 - Mobile monitoring (O_3 , NO_x , CH_4 , VOCs/air toxics)
 - Aircraft observations – leverage NSF-funded Salt Lake City O_3 study
 - Satellite NO_2 and HCHO



New NO_x/NO_y measurements to be maintained by APCD at FTCW, NREL, and Chatfield post-campaign

FTCW study core site

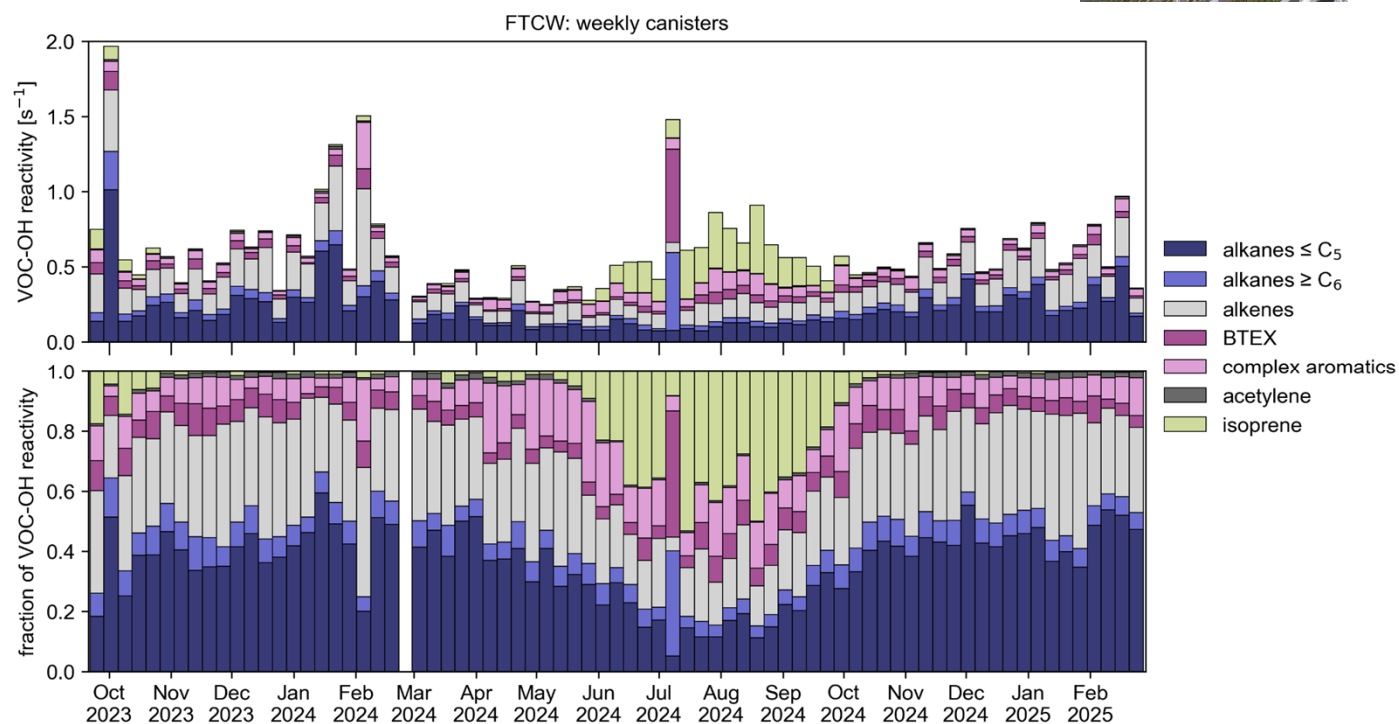
- VOCs (CSU)
 - Online 5-channel GC (hourly)
 - PTR-MS (1-minute)
 - HCHO analyzer (1-minute)
- NO_x (CDPHE & EPA)
- O₃ (CDPHE)

VOC species	Uses
C2-C10 alkanes, alkenes, aromatics, isoprene, halogenated VOCs	Source apportionment, model input
Oxygenated VOCs	Photochemistry, model evaluation
Alkyl nitrates	Air mass aging

>60 VOCs will be speciated at hourly resolution

FTCW VOC insights

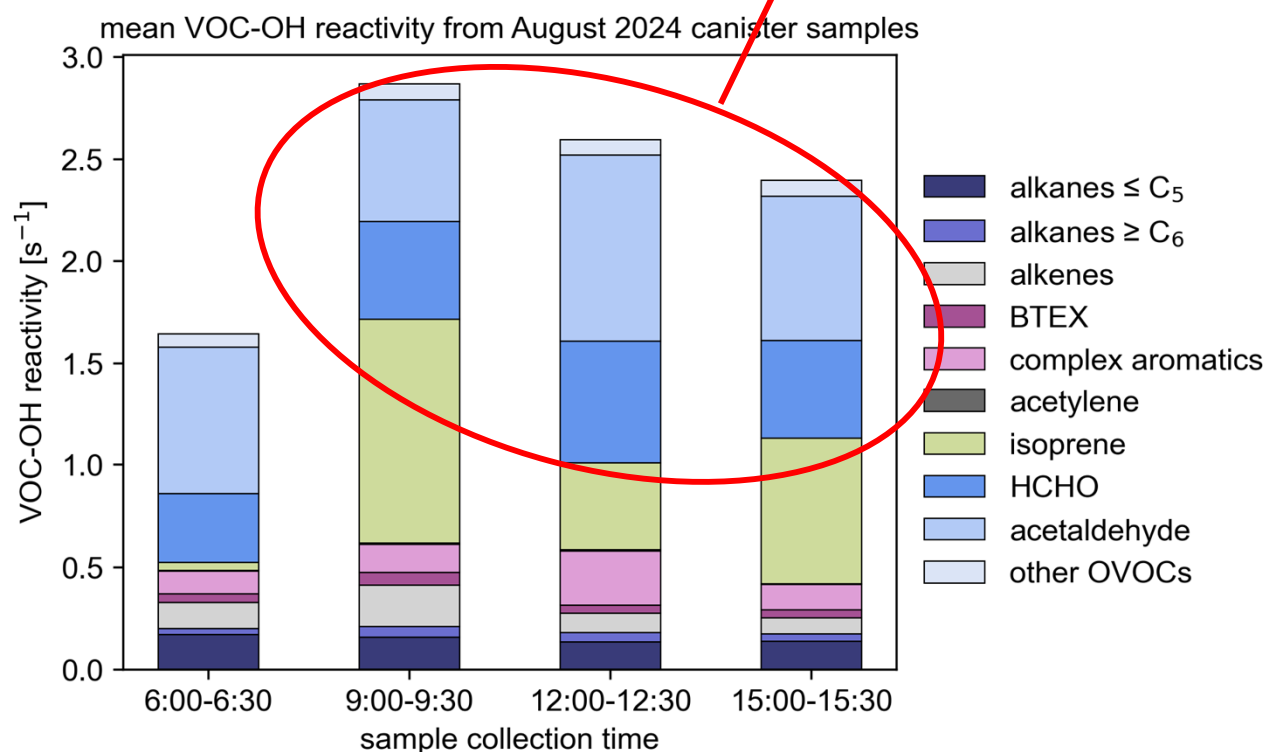
- VOC reactivity in weekly canister samples comes from alkanes + alkenes + aromatics + isoprene (summer)
- What else contributes?



FTCW summer VOC diurnal insights

- Formaldehyde, acetaldehyde and other oxygenated VOCs important contributors to VOC reactivity
- VOC speciation and reactivity change across diurnal cycle

Oxygenated VOCs not measured in many VOC sampling programs



ethane
propane
i-butane
n-butane
i-pentane
n-pentane
cyclopentane
n-hexane
cyclohexane
n-heptane
2-methylhexane
3-methylhexane
methylcyclohexane
2,3-dimethylpentane
2,4-dimethylpentane
2-methylheptane
3-methylheptane
2,2,4-trimethylpentane
2,3,4-trimethylpentane
n-octane
n-nonane
n-decane

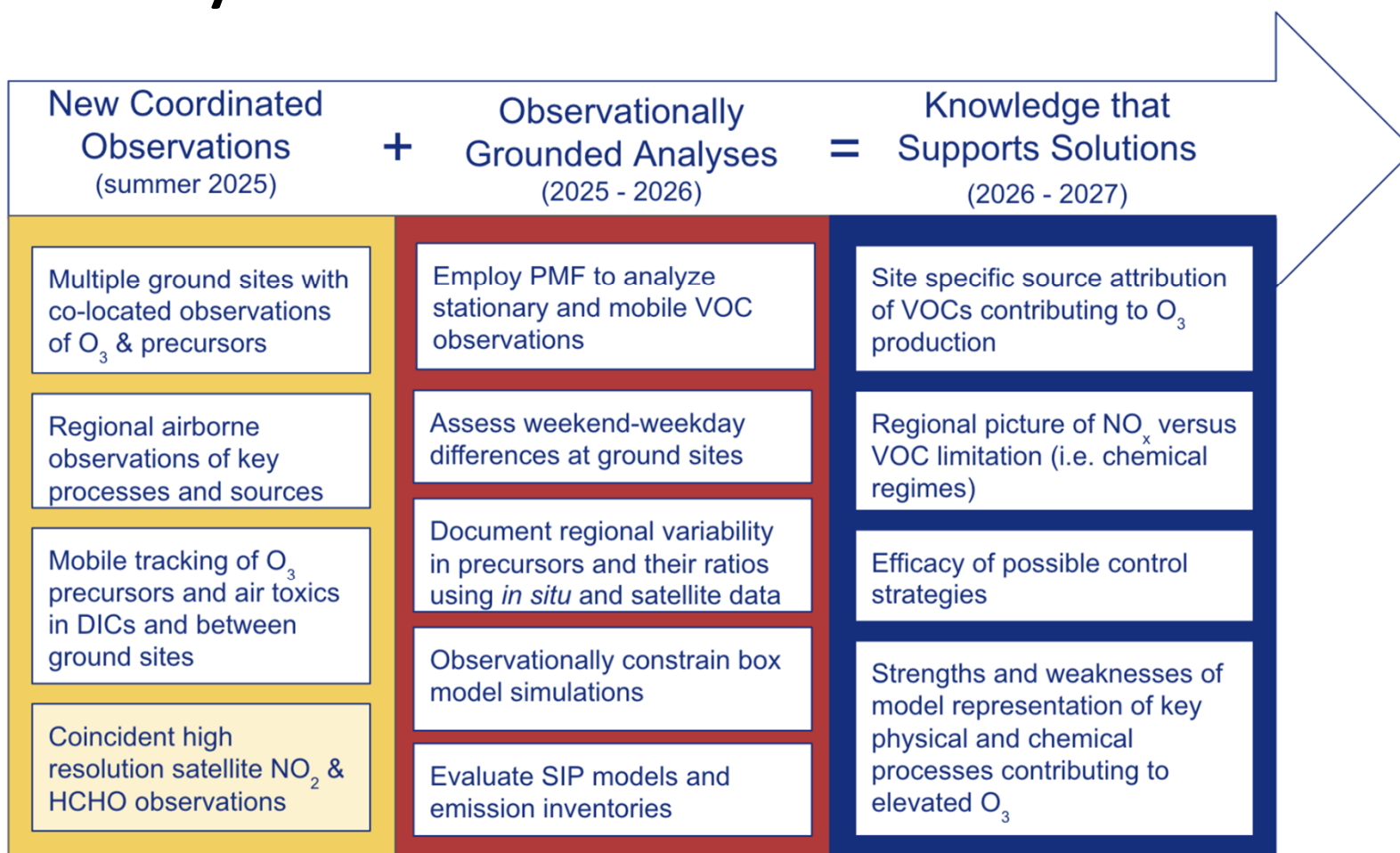
benzene
toluene
ethylbenzene
m+p-xylene
o-xylene
styrene
i-propylbenzene
n-propylbenzene
2-ethyltoluene
3-ethyltoluene
4-ethyltoluene
1,2,3-trimethylbenzene
1,2,4-trimethylbenzene
1,3,5-trimethylbenzene
ethene
propene
1-butene
c-2-pentene
1-hexene
ethyne
a-pinene
b-pinene
isoprene

acetonitrile
acetone
acetaldehyde
MEK
MVK
methanol
DMS
MeONO2
EtONO2
i-PrONO2
n-PrONO2
2-BuONO2
2-PenONO2
3-PenONO2
CHCl3
CHBrCl2
CH2Br2
C2Cl4
C2HCl3
CHBr3
formaldehyde
formic acid
hydrogen cyanide

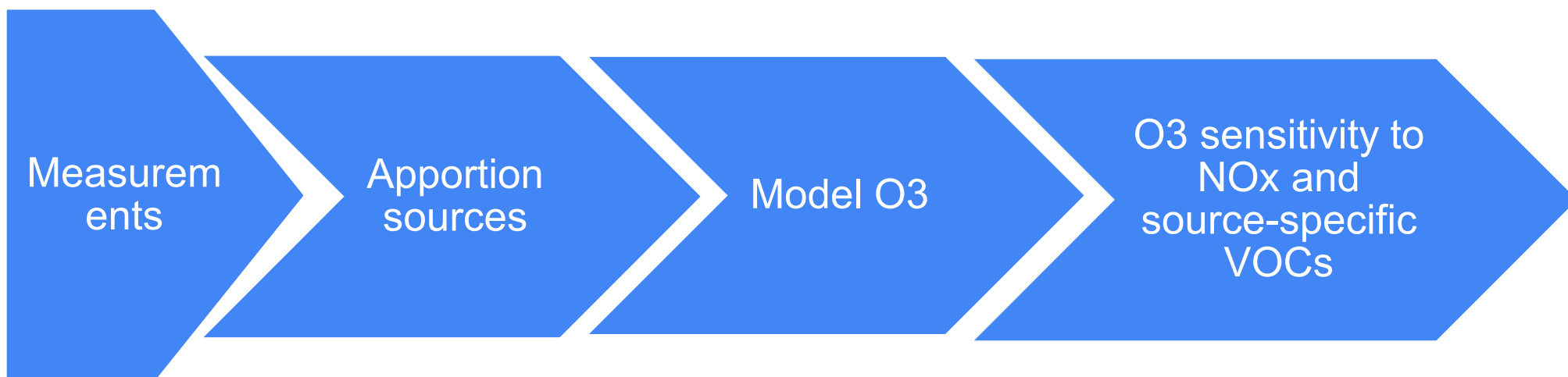
VOCs to be
measured at FTCW
(red + black).

Subset of FTCW
VOCs measured by
Boulder Air at LUR
in 2024 (black)

Study Overview

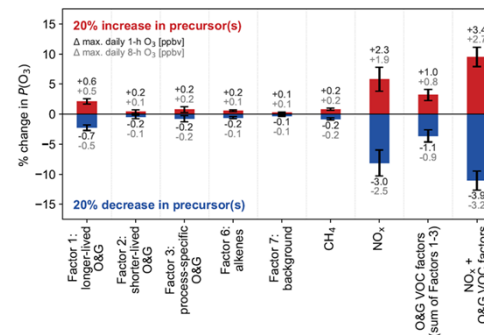


Example set of analyses



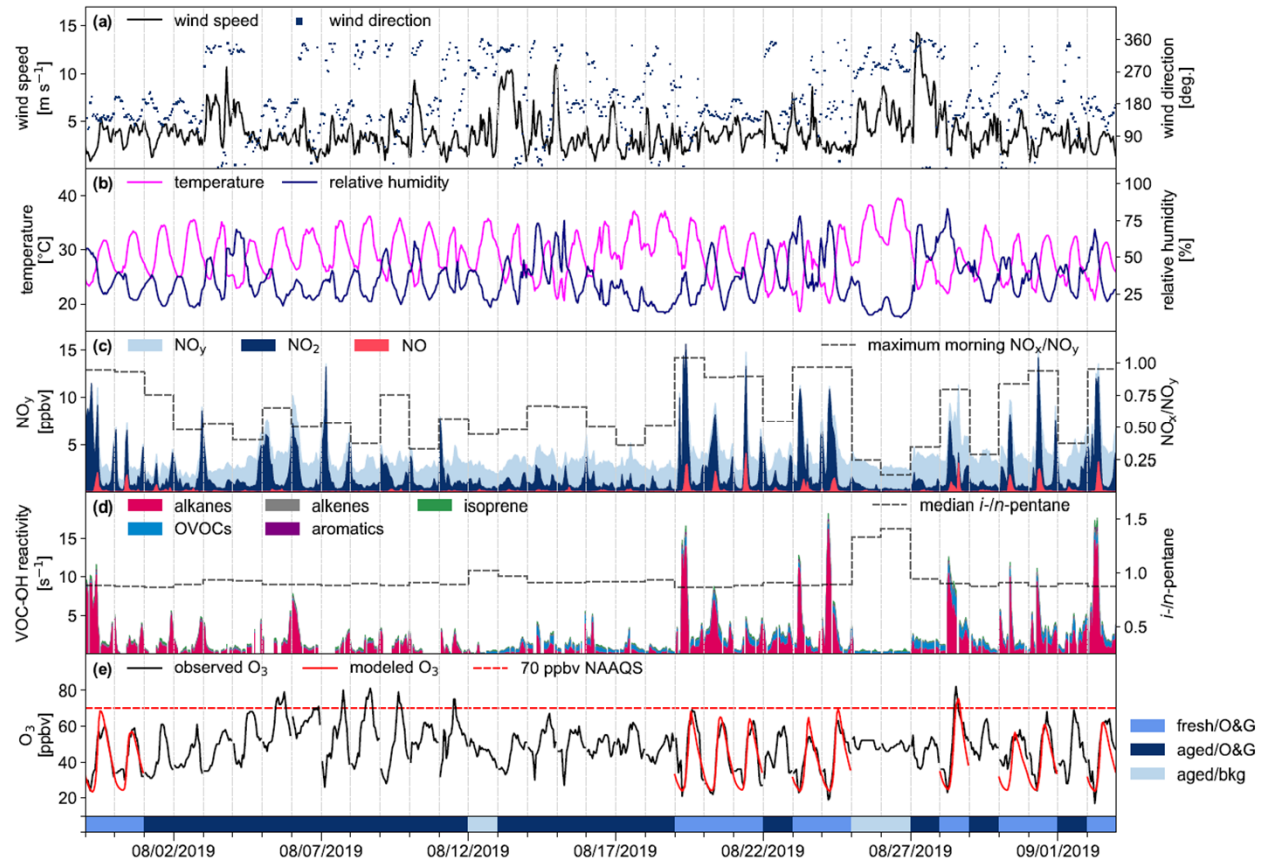
EPA PMF

F0AM
photochemical
box model



Carlsbad Caverns National Park O₃ study example

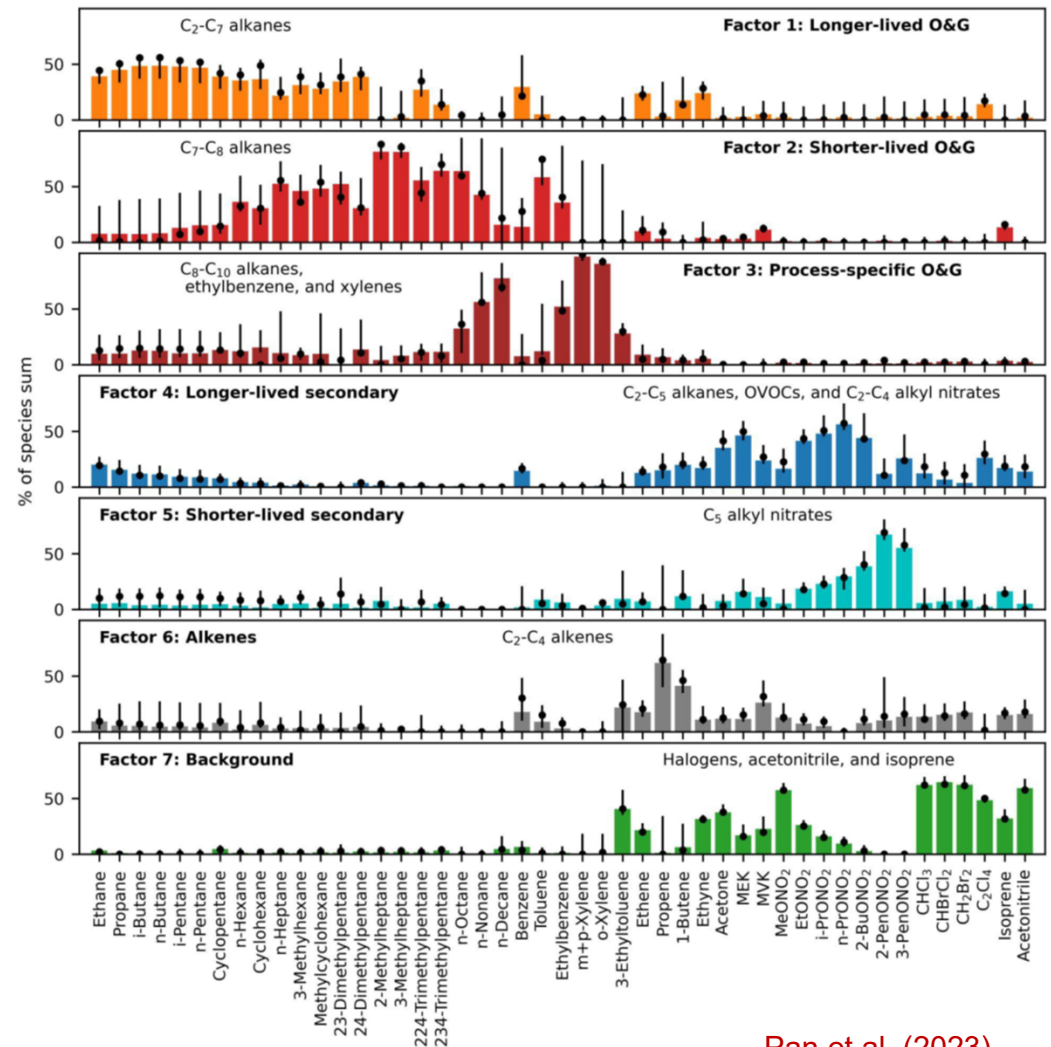
- Summer 2019 field study
 - O₃, NO_x, and VOC measurements similar to FTCW plans
- Analyzed observations
 - VOC source apportionment
 - O₃ sensitivity to NO_x and VOCs
 - Effectiveness of NO_x and VOC control strategies



Marsavin et al. (2024)

Carlsbad Caverns NP O₃ study – source apportionment

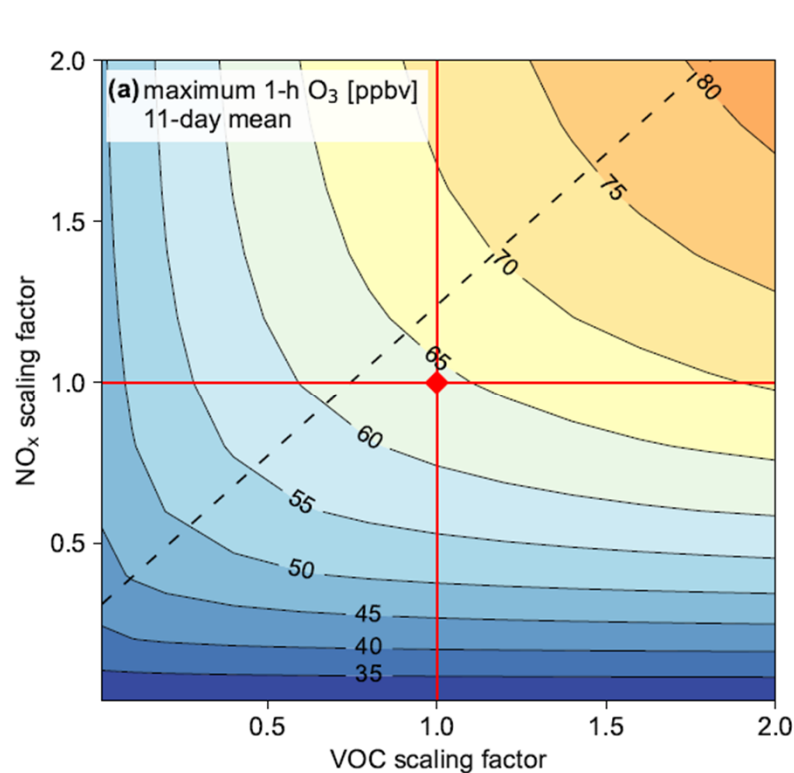
- Source factors representing
 - Long-lived and short-lived O&G
 - Process-specific O&G
 - Alkenes/traffic
 - Background incl. biogenic
 - Secondary



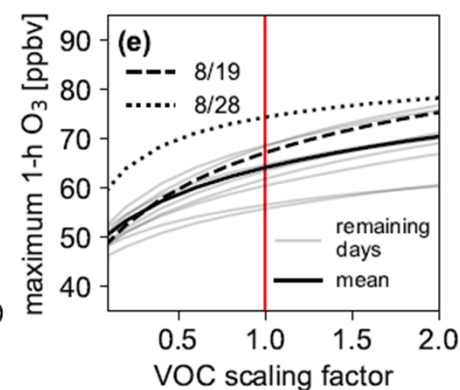
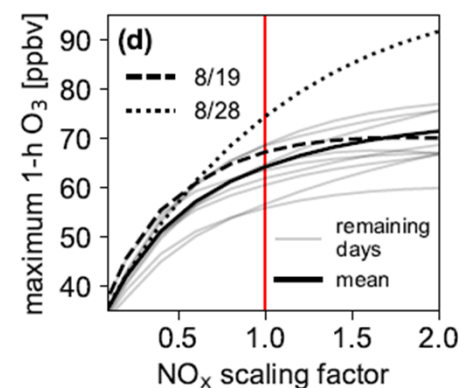
Pan et al. (2023)

Carlsbad Caverns NP O₃ modeling results

- F0AM box model simulations of O₃
 - Location and date specific
 - Constrained by VOC and NO_x observations – not subject to emission inventory uncertainties
 - Rerun with scaled NO_x and VOC inputs
 - Examine NO_x and VOC sensitivity

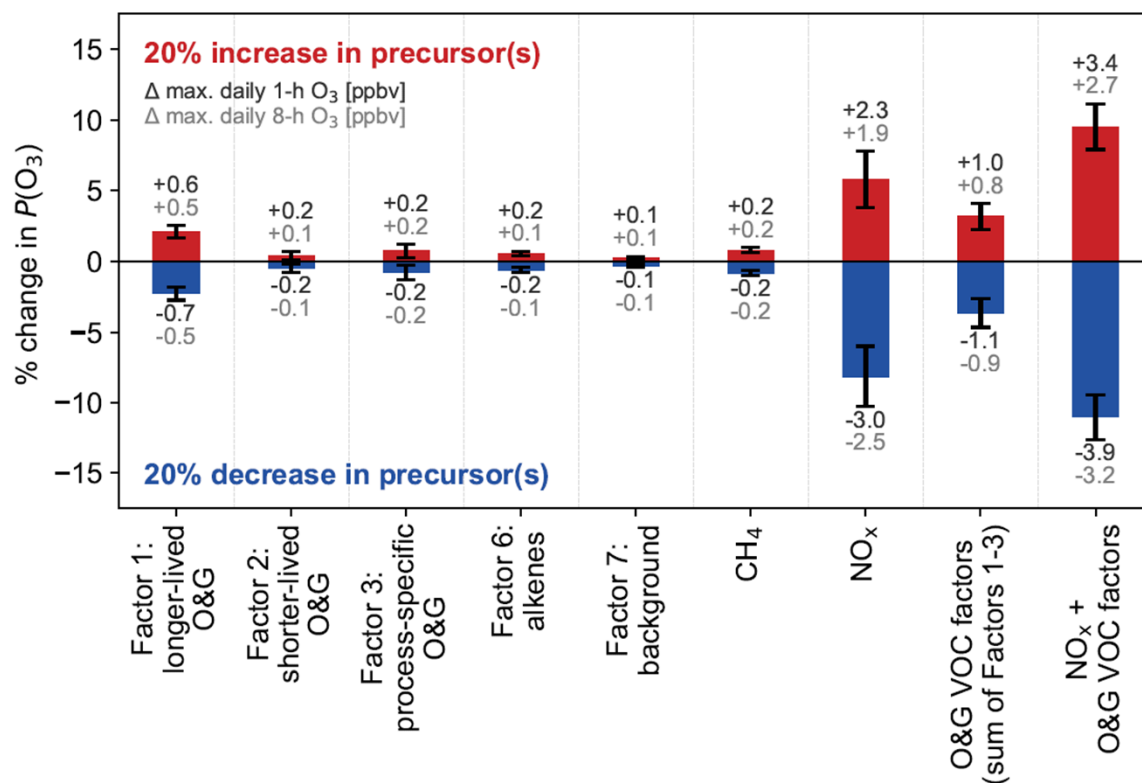


Marsavin et al. (2024)



Carlsbad Caverns NP O₃ sensitivity results

- How does O₃ change for $\pm 20\%$ changes in NO_x and/or O&G VOCs?
 - NO_x sensitivity > VOC sensitivity
 - Decreasing NO_x + VOCs gives best result



Marsavin et al. (2024)

Project timeline

Table 3. Project timeline

[illegible]

LARIMER COUNTY: HEALTH & ENVIRONMENT



Air Quality Updates

March 11, 2025



LCDHE Air Quality Program



Lea Schneider

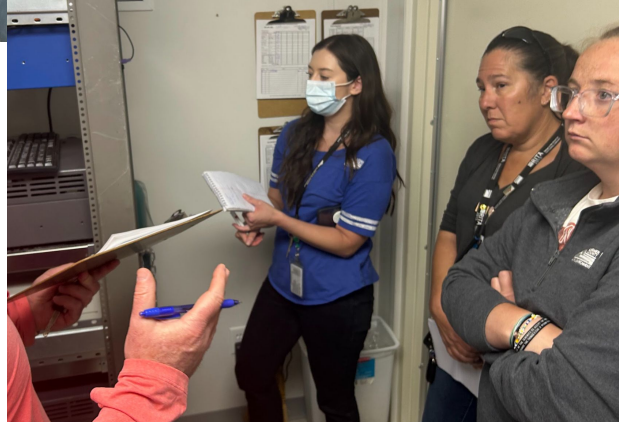
Noel Udell

Jessica Royer

Ashton
Brodahl

Sydney
McLeod

Honorary
mention:
Matt Lafferty

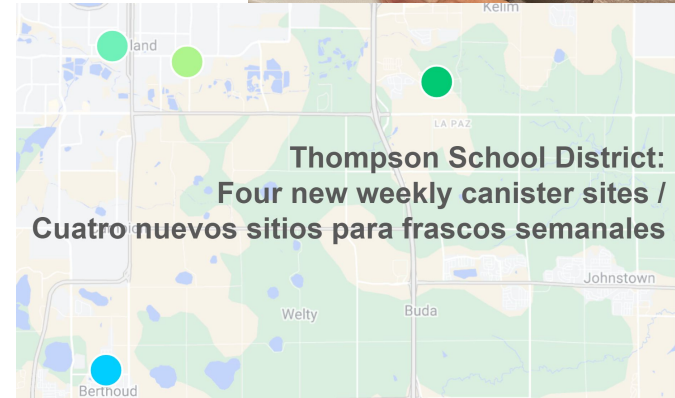


Air Quality Planning: AIR TOXICS

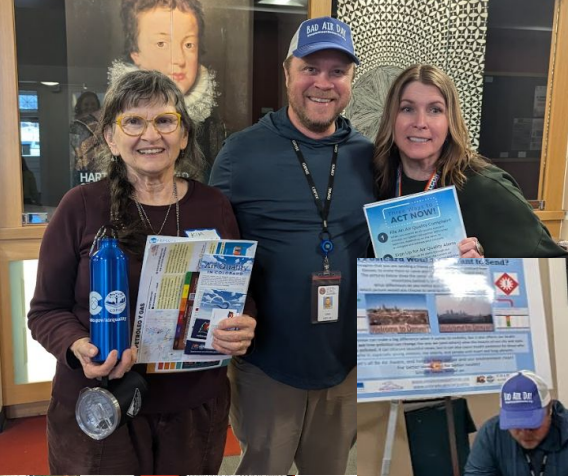


LCDHE, City of Fort Collins and CSU, collaborating on an EPA grant

- Environmental justice-focused air quality grant
 - \$500,000 issued over a period of 3 years
 - monitor air toxics in burdened communities
 - provide understandable air quality education to increase awareness
- Air Quality Monitoring Advisory Committee (AQMAC)
 - includes community members & professionals
 - meetings hosted in English with live Spanish interpretation
 - guide monitoring locations/areas of interest
 - data from LCDHE, EPA and CDPHE Environmental Justice mapping tools
 - CSU Atmospheric Science Department conducts air monitoring
- CSU Center for Environmental Justice
 - Plans & hosts community workshops/events with AQMAC input
 - Kim Abeles smog art collector workshops @ PSD & public
 - family day event @ CSU's Gregory Allicar Museum of Art



Air Quality Planning

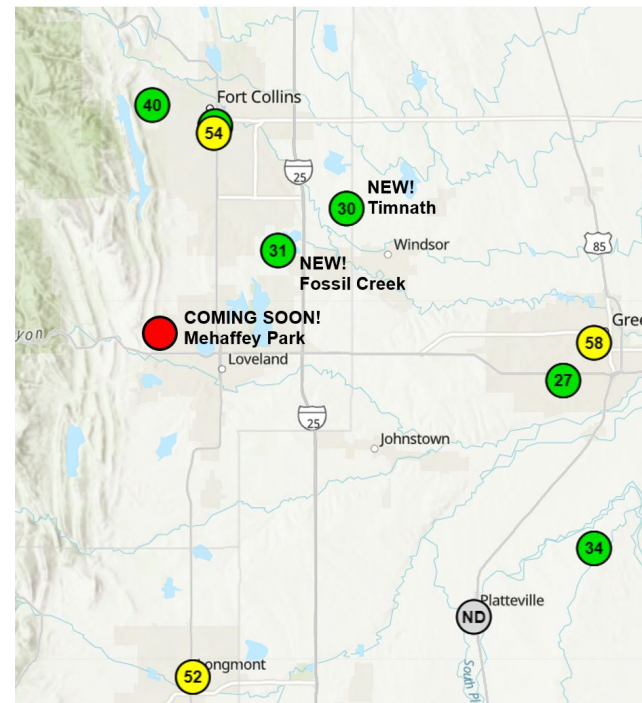


Air Quality Planning: OZONE



Commissioners provided funding for additional air quality monitoring:

- Large gap in state monitoring network between Longmont & FTC
- New locations in Timnath, Fossil Creek Reservoir & Loveland
 - all will include monitors for ozone and NO_x
 - closest NO_x monitor outside of Denver is in LaSalle
 - Loveland site awaiting installation of electricity
- LCDHE staff cross trained with CDPHE APCD
 - LCDHE to maintain monitoring equipment
- Additional BCC funding provided to support long-term VOC monitoring
 - CSU, RAQC and APCD recently awarded a grant for \$1.3 mil
 - monitor and analyze NO_x and VOC in the Denver Metro/North Front Range Ozone Nonattainment Area to support State Planning efforts
- LCDHE & CSU discussing additional VOC monitoring in Larimer



Air Quality Planning



Air Quality Planning



Air Quality Planning: LANDSCAPE PILOT



Commissioners provided grant funding for Commercial Electric Landscaping Equipment

- Last year we focused efforts on residential lawn & garden equipment
- This year we wanted to make a bigger impact with commercial landscapers using equipment all day long
- Use of gas-powered landscaping equipment is linked to increased air pollution and noise levels as seen earlier in the air quality video.
- By investing in electric landscaping equipment, businesses will:
 - reduce air pollution for a healthier environment, and
 - align with Larimer County's commitment to sustainable practices



1 hour gas-powered lawn mower use



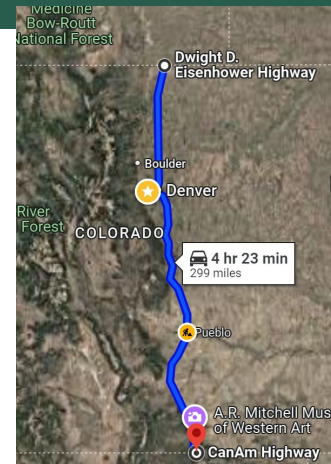
Driving 300 miles



1 hour gas-powered leaf blower use



Driving 1,100 miles



Air Quality Planning: LANDSCAPE PILOT



To reduce air pollution for a healthier environment and align with Larimer County's commitment to sustainable practices, the County provided a grant to incentivize commercial landscaping companies to purchase electric equipment.

Business Eligibility Criteria

- serve at least three customers in Larimer County
- staff of 15 or fewer employees
- pay sales tax on purchased equipment

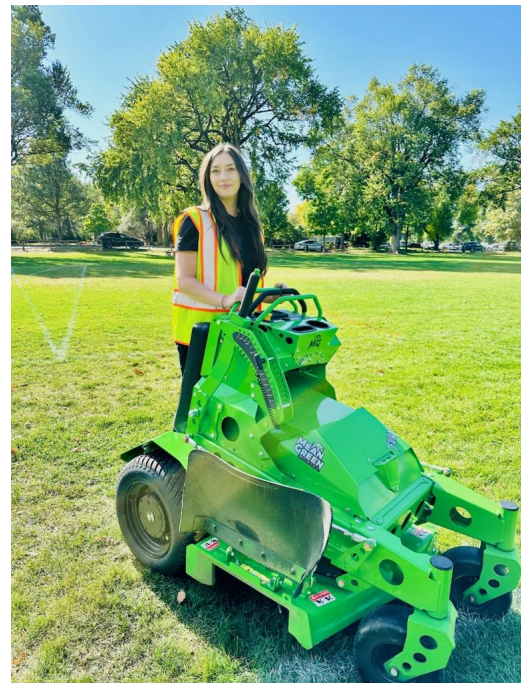
Qualified recipients awarded up to \$6000 vouchers

- redeemed at two qualifying Larimer County retailers
- battery-powered AGZA field-tested & certified commercial brands
- County provided free safety kit (\$600 value) with fire blanket and charger

Program opened September 24, 2024

- 24 businesses applied within 7 days
- 14 applicants were approved for full vouchers
- Waitlist of 58 interested commercial landscapers as of 12/2024

Potential funding for 2025 to be discussed in March.



YEAR 2025 WORKPLAN - DRAFT to BoCC

This workplan provides the goals and general direction the Environmental and Science Advisory Board (ESAB) considers taking in 2025. Because conditions or priorities in the County can change, a considerable degree of flexibility needs to be maintained.

Overall: The ESAB strives to inform, and be informed about, County government-related policies, decisions, issues and actions that have environmental, community and economic implications in order to inform and make recommendations to the Board of County Commissioners and staff as requested. Refer to the 2024 Annual Report for a description of the Work Planning Process. The table below presents a general guide to the ESAB's topics of focus by quarter.

Future Schedule for Regular Agenda Items	
Q1	● 2024 Annual Report – Adopt and submit to BOCC through Assistant County Manager ● 2025 Workplan – Adopt and submit to BOCC through Assistant County Manager ● ESAB Bylaws – Review and revise; Adopt revisions and send to County Attorney ● Environmental Stewardship Awards – Nomination Period through 3/23 ● Larimer on the Move - Presentation from Engineering ● Climate Smart and Future Ready Participation (ongoing throughout the year) ● Air quality monitoring - collaboration with CSU & LCDHE (ongoing throughout the year) [March] ● Forest Health - Big Thompson Watershed Coalition (ongoing throughout the year)
Q2	● Environmental Stewardship Awards – Award Period ● New Member Recruitment and Interviews ● Review EnviroScreen tool or Environmental Impact Assessment - identify disproportionately impacted/underserved communities in LC – CSFR Action Team Recommendations Requested [June?] ● 2024-2028 Strategic Plan (ongoing throughout the year) – AQ / WQ Program Advocacy [June?] ● Legislative update from Shane Atkinson [May?] ● Larimer on the Move - ESAB to provide comments on draft plan and funding sources [April?]
Q3	● New Member Onboarding – Training and Orientations ● Larimer County Procurement Process, ICARE and GHG reduction ● Nuclear Energy Policy guidance – CC4CA alignment (defining “clean” energy) *July or August may be a month off
Q4	● Micromobility in Larimer County – CSFR action team recommendations ● Carbon Capture / GHG Sequestration Analysis – CSFR ● 2024 Annual Report ● ESAB Officer Elections *Veterans Day is a conflict and may have month off

*ESAB may, on staff or Board of County Commissioner request, add input to legislative or County program research